and introduced directly into liquid hydrogen contained in a vacuum jacketed vessel immersed in liquid air. Under these conditions they were exposed to a temperature of about − 252° C. (21° absolute) for ten hours. At the end of the experiment the tubes were opened, and the contents examined microscopically and by culture. The results were entirely negative as regards any alteration in appearance or in vigour of growth of the micro-organisms. It would appear, therefore, that an exposure of ten hours to a temperature of about − 252° C. has no appreciable effect on the vitality of micro-organisms.

We hope to extend these observations upon the influence of the temperature of liquid hydrogen on vital phenomena, and to make them the subject of a future communication, and to discuss their bearing upon problems of vitality.

"Vapour-density of Bromine at High Temperatures.—Supplementary Note." By E. P. PERMAN, D.Sc., and G. A. S. ATKINSON, B.Sc. Communicated by Professor RAMSAY, F.R.S. Received April 28,—Read May 31, 1900.

The authors regret that they had overlooked a monograph by C. Langer and V. Meyer, entitled "Pyrochemische Untersuchungen," containing an account of some experiments on the vapour-density of bromine. Their method was to pass a mixture of bromine vapour and nitrogen into a porcelain tube with capillary ends placed in a furnace in a horizontal position. The bromine and nitrogen were then displaced by a current of carbon dioxide, the bromine being absorbed by potassium iodide solution, and the carbon dioxide by potash solution, while the nitrogen was collected and measured. Temperature was ascertained by displacing the tube full of air in a similar way. By this method Langer and Meyer carried out experiments at "Zimmer-temperatur" 100°, 900°, and 1200°.

The only results comparable with the authors' are those at 900°. Their results at this temperature are 5·478, 5·414, 5·433, 5·382, 5·59, mean 5·459 (air = 1), or 78·88 (H = 1). They say that *these results indicate that the vapour-density of bromine, even when diluted with eleven times its volume of air, is still normal at* 900°.

The mean of our results at this temperature is 78·6, and the density read from the curve (p. 17, vol. 66) is 78·8. This close agreement shows that Langer and Meyer's results really indicate a small amount of dissociation at 900°. Diminution of pressure appears to have little effect at that temperature, as Langer and Meyer used bromine much diluted with nitrogen, while in our experiments there was no decrease of density on reducing the pressure from 767 mm. to 365 mm.

It may be noted that Langer and Meyer give the boiling point of

bromine as 63°, whereas we have found the boiling point of specially purified samples to be very close to 58·9°. (See Ramsay and Young, 'Trans. Chem. Soc.,' vol. 49, p. 454 *et seq.*)

"The Sensitiveness of Silver and of some other Metals to Light."

By Major-General J. WATERHOUSE, I.S.C. (late Assistant Surveyor-General of India). Communicated by Sir W. ABNEY, K.C.B., F.R.S. Received April 25,—Read May 31, 1900.

During some recent investigations on the Daguerreotype process, the question presented itself as to which of the elements forming the sensitive surface of the plate—the silver or the halogens—the sensitiveness was due? Now, although the fact that nearly all compounds of silver, especially the haloids, are more or less sensitive to, and decomposed by, the action of light, has long been known, the sensitiveness of metallic silver itself to light, though observed in 1842, by Moser, has never been generally recognised either by chemists or by photographers.

Moser's Experiment.—Before describing my own experiments, it may be as well to give a description of Moser's experiment taken from the original paper in 'Poggendorff's Annalen,' vol. 56, 1842, p. 210.

"A perfectly new silver plate was thoroughly cleaned and polished. A black tablet with various excised characters was fixed above it, without touching it, and the whole placed in the sun for two hours or more and directed towards it. After the plate, which naturally did not show the least change, was cooled, it was held over mercury, heated as usual to about 60° R. (167° F.). To my great delight a distinct image of the screen was produced in which those parts where the sunlight (which during the course of the experiments was always weak and changeable) had acted, had attracted a quantity of mercury. This interesting experiment was repeated several times with the same result. Sometimes the plates after having been placed in the mercurial vapours were exposed to those of iodine and then placed in the sun, by which the images usually improved."

"If we compare this remarkable fact of the action of light upon surfaces of silver with the above-mentioned phenomena produced by contact, we can no longer doubt that light acts on *all* bodies, modifying them so that they behave differently in condensing the vapours of mercury. A similar experiment was made with copper during unfavourable weather. The copper was not well polished, and, consequently, the image produced by the mercurial vapours was faint, although clearly visible. By exposing the plate to the vapour of iodine the image became stronger, and this method was found useful in experiments with copper. A plate of clean mirror-glass was